pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

**NORTHWEST REGIONAL OFFICE**
**CLEAN WATER PROGRAM**

| | | | |
|---|---|---|---|
| Application Type | **Renewal** | Application No. | **PA0020346** |
| Facility Type | **Sewage** | APS ID | **773049** |
| Major / Minor | **Major** | Authorization ID | **914926** |

# NPDES PERMIT FACT SHEET
# MAJOR RENEWALS
# POTWs

## Applicant and Facility Information

| | | | |
|---|---|---|---|
| Applicant Name | **Punxsutawney Borough** | Facility Name | **Punxsutawney Borough STP** |
| Applicant Address | 301 East Mahoning Street, Suite 1 | Facility Address | Water Street Extension |
| | Punxsutawney, PA 15767 | | Punxsutawney, PA 15767 |
| Applicant Contact | Mr. Benjamin R. White | Facility Contact | Mr. Chuck Hess |
| Applicant Phone | 814-938-4480 | Facility Phone | 814-938-4396 |
| Client ID | 35102 | Site ID | 261803 |
| Ch 94 Load Status | Not Overloaded | Municipality | Punxsutawney Borough |
| Connection Status | No Limitations | County | Jefferson |
| Date Application Received | February 16, 2012 | EPA Waived? | No |
| Date Application Accepted | February 16, 2012 | If No, Reason | Major Facility, Receives O&G Wastewater |
| Purpose of Application | Renewal of NPDES permit for discharge of treated Sewage. | | |

## Internal Review and Recommendations

Act 14 - Proof of Notification was submitted and received.

A Part II Water Quality Management permit is not required at this time.

The 2011 Chapter 94 report was reviewed and this facility is neither hydraulically nor organically overloaded.

The applicant should be able to continue to meet the limits of this permit, which will continue to protect the uses of the receiving stream.

I. OTHER REQUIREMENTS:

A. Stormwater into sewers
B. Right of way
C. Department revocation of permit
D. Solids handling
E. Effluent Chlorine Optimization and Minimization
F. Radiation Protection Action Plan

SPECIAL CONDITIONS:

II. Requirement to Use eDMR System
III. Solids Management
IV. Chronic WET Limitations
V. Combined Sewer Overflows
VI. POTW Pretreatment Program Implementation
VII. Acceptance of Natural Gas-Related Wastewaters
VIII. Chapter 95 Treatment Requirements
IX. Engineering Evaluation of the Second Oxidation Ditch
X. Requirement To Sample For Al, Fe, and Mn During NPDES Renewal
XI. Toxics Reduction Evaluation (TRE)

| Approve | Return | Deny | Signatures | Date |
|---|---|---|---|---|
| X | | | Stephen A. McCauley, E.I.T. / Environmental Engineering Specialist — Draft: Final: | |
| X | | | David G. Balog, P.E. / Environmental Engineer Manager — Draft: Final: | |
| X | | | John A. Holden, P.E. / Program Manager | |

| Discharge, Receiving Waters and Water Supply Information | | | |
|---|---|---|---|
| Outfall No. | 001 | Design Flow (MGD) | 2.4 |
| Latitude | 40° 56’ 29.00” | Longitude | 79° 0’ 6.60” |
| Quad Name | Valier | Quad Code | 1113 (NWRO Map 5071) |
| Wastewater Description: | Municipal sanitary wastewater from the Punxsutawney Borough and the Young and Bell Townships and up to 15,000 gpd of natural gas-related wastewater from non-Shale Gas Extraction (SGE) wells. | | |
| Receiving Waters | Mahoning Creek | Stream Code | 47252 |
| NHD Com ID | 123864701 | RMI | 53.4 |
| Drainage Area | 155.147 | Yield (cfs/mi$^2$) | 0.11 |
| $Q_{7-10}$ Flow (cfs) | 17.0 | $Q_{7-10}$ Basis | Mahoning Creek Gage |
| Elevation (ft) | 1236 | Slope (ft/ft) | 0.00061 |
| Watershed No. | 17-D | Chapter 93 Class. | WWF |
| Existing Use | WWF | Existing Use Qualifier | - |
| Exceptions to Use | None | Exceptions to Criteria | None |
| Assessment Status | Impaired | | |
| Cause(s) of Impairment | Thermal Modifications, Siltation, Metals, Nutrients | | |
| Source(s) of Impairment | Removal of Vegetation, Urban Runoff/Storm Sewers, Abandoned Mine Drainage, Channelization | | |
| TMDL Status | Pending | Name | - |
| Nearest Downstream Public Water Supply Intake | Kittanning Suburban Joint Water Authority intake in Armstrong County | | |
| PWS Waters | Allegheny River | Flow at Intake (cfs) | 987.0 |
| PWS RMI | 45.6 | Distance from Outfall (mi) | 63.0 |

Changes Since Last Permit Issuance:

The previous NPDES Permit had mass loading limits in place for Barium, Boron, Cadmium, Dissolved Iron, Total Iron, and Zinc due to this facility accepting natural gas-related wastewater along with two other facilities in the same watershed. However, one of those two other facilities, Hart Resources, was never constructed. With that new information available, new Pentox modeling was run for the two dischargers that actually exist, the Punxsutawney STP and the Dominion Transmission facility. Due to the new modeling, no WQBELs are required for Barium, Boron, Cadmium, Dissolved Iron, or Total Iron for the Punxsutawney STP. The previous limits were removed since the newly calculated WQBELs far exceed the effluent concentrations. The anti-backsliding provision has been verified because new information has become available that the Hart Resources discharge will not exist. A Total Zinc WQBEL was calculated (see Attachment 15) based on data provided by the EPA (see Attachment 16) during the first draft comment period. This Fact Sheet is for the second draft NPDES Permit to add the new Zinc WQBEL.

In addition, monitoring and reporting requirements for known pollutants of concern with regard to the acceptance of natural gas-related wastewaters have been added in accordance with the requirements of Chapter 95.10.

There was one failure for C. Dubia among the four WET tests submitted with the renewal NPDES application. As a result, a chronic WET limit of 5.0 TU and the TIE/TRE Special Condition were added to the permit.

Other Comments:

Permitted treatment (WQM Permit no. 3394401) consists of a CSO bypass structure, a headworks structure consisting of fine screen and influent pump station, aeroductor and grit washer, grease trap, two parallel treatment trains each

consisting of a 336,576 gallon oxidation ditch, a 296,120 gallon clarifier, and a 75,205 gallon chlorine contact tank, combining into a 16,666 gallon dechlorination tank followed by an effluent pump station. Sludge is processed through a 214,159 gallon aerobic sludge digester, a 214,159 gallon secondary aerobic sludge digester, and a filter press.

The Punxsutawney Borough STP receives 6.5% of its flow from Young Township and 3.2% of its flow from Bell Township, both of which are separate sewer systems. The remaining 90.3% of the flow comes from the Punxsutawney Borough, which is an approximately 90% separate and 10% combined sewer system.

The Combined Sewer Overflow (CSO) Nine Minimum Controls (NMC) have been implemented at this facility.

A 2012 revision to the Long-Term Control Plan (LTCP) was submitted with the NPDES Permit renewal application for this facility.

The 85% capture requirement was met for the year 2011. The Punxsutawney STP was able to capture and treat 87.9% of its combined sanitary and stormwater flow for the year 2011.

This facility accepts 3,953 gallons per day, or 78,874 gallons per month of hauled-in residual waste.

The Dan-Pun brine pretreatment facility is located on the Punxsutawney Borough STP site and began operations in 2009 and received upgrades in 2011. It accepts trucked in wastewaters from conventional (shallow) oil & gas wells in the Devonian formation located in Armstrong, Indiana, Jefferson, and Clearfield Counties. The wastewater is pretreated and then piped directly into the Punxsutawney Borough STP.

This facility was authorized with the issuance of NPDES Permit number PA0020346 on December 1, 2007, to accept up to 15,000 gpd of natural gas-related wastewater from the Punxsutawney Brine Treatment Facility, which is located on-site. The approval to accept natural gas-related wastewater at this facility predates the final passage of Chapter 95.10 on August 21, 2010, and there are no plans to accept any increased volumes of natural gas-related wastewaters. Therefore, this facility is classified under Chapter 95.10 as an **Authorized Load / No increase**.

Combined Sewer Overflow (CSO) details:

For Outfall: **002** Latitude: **40° 56’ 29”** Longitude: **78° 58’ 40”** River Mile Index: **54.26** Stream Code: **47252**

Location: **Mulberry Square Manhole 34**

For Outfall: **003** Latitude: **40° 56’ 24”** Longitude: **78° 58’ 55”** River Mile Index: **54.00** Stream Code: **47252**

Location: **Bilo Pump Station**

For Outfall: **004** Latitude: **40° 56’ 27”** Longitude: **78° 59’ 16”** River Mile Index: **53.47** Stream Code: **47252**

Location: **Railroad Bridge Manhole 20**

For Outfall: **005** Latitude: **40° 56’ 32”** Longitude: **79° 00’ 04”** River Mile Index: **52.43** Stream Code: **47252**

Location: **STP headworks**

Receiving Waters: **Mahoning Creek.**

Type of Effluent: **Combined Sewer Overflows - Refer to Special Condition V in Part C of this Permit.**

**Water Quality Based Effluent Limit for Combined Sewer Overflows (CSOs):**

Monitor CSOs for cause, frequency, and duration and measure every overflow event volume to demonstrate compliance with the Nine Minimum Controls (NMCs). The Permittee shall achieve a minimum of 85% capture and treatment of combined sewer annual flow volume, collected during precipitation events, in accordance with the Long Term Control Plan (LTCP) to comply with the Water Quality Standards.

## Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (362-0400-001) and/or BPJ.

**Outfall 001, Effective Period: Permit Effective Date through June 30, 2016**

| Parameter | Effluent Limitations | | | | | | Monitoring Requirements | |
|---|---|---|---|---|---|---|---|---|
| | Mass Units (lbs/day) | | Concentrations (mg/L) | | | | Minimum Measurement Frequency | Required Sample Type |
| | Average Monthly | Weekly Average | Minimum | Average Monthly | Weekly Average | Instant. Maximum | | |
| Flow (MGD) | Report | Report Daily Max | XXX | XXX | XXX | XXX | Continuous | Measured |
| pH (S.U.) | XXX | XXX | 6.0 | XXX | XXX | 9.0 | 1/day | Grab |
| Total Residual Chlorine | XXX | XXX | XXX | 0.5 | XXX | 1.6 | 1/day | Grab |
| CBOD5 | 430 | 645 | XXX | 21.5 | 32.0 | 43.0 | 2/week | 24-Hr Composite |
| Total Suspended Solids | 600 | 900 | XXX | 30 | 45 | 60 | 2/week | 24-Hr Composite |
| Fecal Coliform (CFU/100 ml) May 1 - Sep 30 | XXX | XXX | XXX | 200 Geo Mean | XXX | 1,000 | 2/week | Grab |
| Fecal Coliform (CFU/100 ml) Oct 1 - Apr 30 | XXX | XXX | XXX | 2,000 Geo Mean | XXX | 10,000 | 2/week | Grab |
| Ammonia-Nitrogen May 1 - Oct 31 | 150 | XXX | XXX | 7.5 | XXX | 15.0 | 2/week | 24-Hr Composite |
| Ammonia-Nitrogen Nov 1 - Apr 30 | 450 | XXX | XXX | 22.5 | XXX | 45.0 | 2/week | 24-Hr Composite |
| Total Dissolved Solids | Report | 48,000 Daily Max | XXX | Report | XXX | Report | 1/week | 24-Hr Composite |
| Osmotic Pressure (mOs/kg) | XXX | XXX | XXX | Report | XXX | Report | 1/week | 24-Hr Composite |
| Total Barium | Report | XXX | XXX | Report | XXX | Report | 1/week | 24-Hr Composite |
| Total Strontium | Report | XXX | XXX | Report | XXX | Report | 1/week | 24-Hr Composite |

**Outfall 001, Continued (from Permit Effective Date through June 30, 2016)**

| Parameter | Effluent Limitations | | | | | | Monitoring Requirements | |
|---|---|---|---|---|---|---|---|---|
| | Mass Units (lbs/day) | | Concentrations (mg/L) | | | | Minimum Measurement Frequency | Required Sample Type |
| | Average Monthly | Weekly Average | Minimum | Average Monthly | Weekly Average | Instant. Maximum | | |
| Total Uranium (µg/L) | Report | XXX | XXX | Report | XXX | Report | 1/week | 24-Hr Composite |
| Total Zinc | Report | XXX | XXX | Report | Report Daily Max | Report | 1/week | 24-Hr Composite |
| Chloride | Report | XXX | XXX | Report | XXX | Report | 1/week | 24-Hr Composite |
| Bromide | Report | XXX | XXX | Report | XXX | Report | 1/week | 24-Hr Composite |
| Gross Alpha (pCi/L) | XXX | XXX | XXX | Report | XXX | Report | 1/week | 24-Hr Composite |
| Radium 226/228, Total (pCi/L) | XXX | XXX | XXX | Report | XXX | Report | 1/week | 24-Hr Composite |
| Chronic Toxicity - Ceriodaphnia Survival (TUc) | XXX | XXX | XXX | 5.0 Daily Max | XXX | XXX | See Permit** | 24-Hr Composite |
| Chronic Toxicity - Ceriodaphnia Reproduction (TUc) | XXX | XXX | XXX | 5.0 Daily Max | XXX | XXX | See Permit** | 24-Hr Composite |
| Chronic Toxicity - Pimephales Survival (TUc) | XXX | XXX | XXX | 5.0 Daily Max | XXX | XXX | See Permit** | 24-Hr Composite |
| Chronic Toxicity - Pimephales Growth (TUc) | XXX | XXX | XXX | 5.0 Daily Max | XXX | XXX | See Permit** | 24-Hr Composite |

** The permittee shall conduct Whole Effluent Toxicity (WET) tests at a frequency of 1/quarter for the first year following permit issuance, which may be reduced to 1/year thereafter, as described in Part C of this permit.

Compliance Sampling Location: Outfall 001, after disinfection.

The limits for $CBOD_5$ and Total Suspended Solids are technology based on 40 CFR 133. The limits for Ammonia-Nitrogen ($NH_3$-N) and pH are water quality based on Chapter 93.7. Flow is monitor only. The limits for Fecal Coliforms are water quality based on Chapter 92a.47. The limits for Total Residual Chlorine (TRC) are technology based on Chapter 92a.48. Osmotic Pressure (mOs/kg), Total Barium, Total Strontium, Total Uranium (µg/L), Chloride, Bromide, Gross Alpha (pCi/L), and Radium 226/228, Total (pCi/L) are monitor only based on Chapter 95.10 due to the acceptance of natural gas-related wastewater. The limit for Total Dissolved Solids is technology-based on sampling results prior to August 21, 2010. The WET limits are water quality-based. Total Zinc is monitor only.

## Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (362-0400-001) and/or BPJ.

**Outfall 001, Effective Period: July 1, 2016 through Permit Expiration Date**

| Parameter | Effluent Limitations | | | | | | Monitoring Requirements | |
|---|---|---|---|---|---|---|---|---|
| | Mass Units (lbs/day) | | Concentrations (mg/L) | | | | Minimum Measurement Frequency | Required Sample Type |
| | Average Monthly | Weekly Average | Minimum | Average Monthly | Weekly Average | Instant. Maximum | | |
| Flow (MGD) | Report | Report Daily Max | XXX | XXX | XXX | XXX | Continuous | Measured |
| pH (S.U.) | XXX | XXX | 6.0 | XXX | XXX | 9.0 | 1/day | Grab |
| Total Residual Chlorine | XXX | XXX | XXX | 0.5 | XXX | 1.6 | 1/day | Grab |
| CBOD5 | 430 | 645 | XXX | 21.5 | 32.0 | 43.0 | 2/week | 24-Hr Composite |
| Total Suspended Solids | 600 | 900 | XXX | 30 | 45 | 60 | 2/week | 24-Hr Composite |
| Fecal Coliform (CFU/100 ml) May 1 - Sep 30 | XXX | XXX | XXX | 200 Geo Mean | XXX | 1,000 | 2/week | Grab |
| Fecal Coliform (CFU/100 ml) Oct 1 - Apr 30 | XXX | XXX | XXX | 2,000 Geo Mean | XXX | 10,000 | 2/week | Grab |
| Ammonia-Nitrogen May 1 - Oct 31 | 150 | XXX | XXX | 7.5 | XXX | 15.0 | 2/week | 24-Hr Composite |
| Ammonia-Nitrogen Nov 1 - Apr 30 | 450 | XXX | XXX | 22.5 | XXX | 45.0 | 2/week | 24-Hr Composite |
| Total Dissolved Solids | Report | 48,000 Daily Max | XXX | Report | XXX | Report | 1/week | 24-Hr Composite |
| Osmotic Pressure (mOs/kg) | XXX | XXX | XXX | Report | XXX | Report | 1/week | 24-Hr Composite |
| Total Barium | Report | XXX | XXX | Report | XXX | Report | 1/week | 24-Hr Composite |
| Total Strontium | Report | XXX | XXX | Report | XXX | Report | 1/week | 24-Hr Composite |

**Outfall 001, Continued (from July 1, 2016 through Permit Expiration Date)**

| Parameter | Effluent Limitations | | | | | | Monitoring Requirements | |
|---|---|---|---|---|---|---|---|---|
| | Mass Units (lbs/day) | | Concentrations (mg/L) | | | | Minimum Measurement Frequency | Required Sample Type |
| | Average Monthly | Weekly Average | Minimum | Average Monthly | Weekly Average | Instant. Maximum | | |
| Total Uranium (µg/L) | Report | XXX | XXX | Report | XXX | Report | 1/week | 24-Hr Composite |
| Total Zinc | 15.4 | XXX | XXX | 0.77 | 1.54 Daily Max | 1.92 | 1/week | 24-Hr Composite |
| Chloride | Report | XXX | XXX | Report | XXX | Report | 1/week | 24-Hr Composite |
| Bromide | Report | XXX | XXX | Report | XXX | Report | 1/week | 24-Hr Composite |
| Gross Alpha (pCi/L) | XXX | XXX | XXX | Report | XXX | Report | 1/week | 24-Hr Composite |
| Radium 226/228, Total (pCi/L) | XXX | XXX | XXX | Report | XXX | Report | 1/week | 24-Hr Composite |
| Chronic Toxicity - Ceriodaphnia Survival (TUc) | XXX | XXX | XXX | 5.0 Daily Max | XXX | XXX | See Permit** | 24-Hr Composite |
| Chronic Toxicity - Ceriodaphnia Reproduction (TUc) | XXX | XXX | XXX | 5.0 Daily Max | XXX | XXX | See Permit** | 24-Hr Composite |
| Chronic Toxicity - Pimephales Survival (TUc) | XXX | XXX | XXX | 5.0 Daily Max | XXX | XXX | See Permit** | 24-Hr Composite |
| Chronic Toxicity - Pimephales Growth (TUc) | XXX | XXX | XXX | 5.0 Daily Max | XXX | XXX | See Permit** | 24-Hr Composite |

** The permittee shall conduct Whole Effluent Toxicity (WET) tests at a frequency of 1/quarter for the first year following permit issuance, which may be reduced to 1/year thereafter, as described in Part C of this permit.

Compliance Sampling Location: Outfall 001, after disinfection.

The limits for $CBOD_5$ and Total Suspended Solids are technology based on 40 CFR 133. The limits for Ammonia-Nitrogen ($NH_3$-N) and pH are water quality based on Chapter 93.7. Flow is monitor only. The limits for Fecal Coliforms are water quality based on Chapter 92a.47. The limits for Total Residual Chlorine (TRC) are technology based on Chapter 92a.48. Osmotic Pressure (mOs/kg), Total Barium, Total Strontium, Total Uranium (µg/L), Chloride, Bromide, Gross Alpha (pCi/L), and Radium 226/228, Total (pCi/L) are monitor only based on Chapter 95.10 due to the acceptance of natural gas-related wastewater. The limit for Total Dissolved Solids is technology-based on sampling results prior to August 21, 2010. The WET limits are water quality-based. Total Zinc is water quality based on Chapter 16.

## WATER QUALITY PROTECTION REPORT

Prepared by: Stephen McCauley
Date: 4/19/2013

Permittee Name: Punxsutawney Borough
Site Name: Punxsutawney Borough STP
Permit Number: PA0020346

Municipality: Punxsutawney Borough
County: Jefferson County

Narrative: This report details the determination of draft NPDES permit limits for an existing major discharge of 2.4 MGD of treated sewage from a Publicly Owned Treatment Works (POTW) in the Borough of Punxsutawney, Pennsylvania. The discharge flows to the Mahoning Creek, which is a Warm Water Fishery that is a tributary of the Allegheny River.

The Punxsutawney Borough STP has five CSO points and is also permitted to accept up to 15,000 gpd of pretreated natural gas-related wastewater from non-shale gas extraction (SGE) sources only.

Facility Layout: See the aerial map (Attachment 1) and the topographical map (Attachment 3)

### 1. Streamflow:

The $Q_{7-10}$ low flow was determined by calculating the yieldrate of the nearest stream with a gage station:

| | | | | |
|---|---|---|---|---|
| Mahoning Creek at Punxsutawney, PA: | $Q_{7-10}$: | 17.4 | cfs | (see Attachment 5) |
| USGS Gage no. 03034000 | Drainage Area: | 158 | sq. mi. | (see Attachment 5) |
| | Yield Rate: | 0.11 | cfsm | (calculated) |

The drainage area for the receiving stream was then computed using the USGS StreamStats website.

| | | | | |
|---|---|---|---|---|
| Mahoning Creek: | Yieldrate: | 0.11 | cfsm | (calculated above) |
| | Drainage Area: | 155.1 | sq. mi. | (Outfall 001 - see Attachment 6) |
| | % of stream allocated: | 100% | | Basis: Current policy |
| | $Q_{7-10}$: | 17.0 | cfs | (calculated) |

### 2. Wasteflow:

Outfall 001: 2.40 MGD = 3.71 cfs

Runoff flow period: 24 hours Basis: Runoff flow for a Municipal STP

### 3. Parameters:

The following parameters were evaluated: pH, Total Suspended Solids, Fecal Coliform, Phosphorus, $NH_3$-N, $CBOD_5$, Dissolved Oxygen, and Total Residual Chlorine. $NH_3$-N, $CBOD_5$, and Dissolved Oxygen were evaluated using WQM 7.0 at the discharge point.

$NO_2$-$NO_3$, Fluoride, Phenolics, Sulfates, and Chlorides can be evaluated using PentoxSD at the nearest downstream potable water supply (PWS). Since there is significant dilution available, no modeling was performed for this facility. However, TDS was evaluated due to the acceptance of natural gas-related wastewater at this facility.

a. pH

Between 6.0 and 9.0 at all times

Basis: Chapter 93.7

b. Total Suspended Solids

Limits are 30 mg/l as a monthly average and 60 as a daily maximum.

Basis: Application of technology-based limits

c. Fecal Coliform

| | | |
|---|---|---|
| 05/01 - 09/30: | 200/100ml | (Monthly Average Geometric Mean) |
| | 1,000/100ml | (Instantaneous Maximum) |
| 10/01 - 04/30: | 2,000/100ml | (Monthly Average Geometric Mean) |
| | 10,000/100ml | (Instantaneous Maximum) |

Basis: Chapter 93.7

d. Phosphorus

☐ Limit necessary due to:

☐ Discharge to lake, pond, or impoundment
☐ Discharge to stream

☒ Limit not necessary

Basis: Chapter 96.5 does not apply.

e. $NO_2$-$NO_3$, Fluoride, Phenolics, Sulfates, and Chlorides

Nearest Downstream potable water supply (PWS): Kittanning Suburban Joint Water Authority intake in Armstrong County

Distance downstream from the point of discharge 63.0 miles (Approximate)

☒ No limits necessary
☐ Limits needed

Basis: Significant dilution available.

f. Total Dissolved Solids (TDS)

TDS were evaluated to protect the water quality standards at the nearest downstream PWS intake.

To calculate the TDS capacity for the Allegheny River at the Kittanning Suburban Joint Water Authority (PWS) intake, the $Q_{7-10}$ low flow for the PWS is needed. From the Fact Sheet, the $Q_{7-10}$ low flow for the Allegheny River at the PWS was calculated as 987.0 cfs. Since no background TDS data is readily available, an assumed value of 150 mg/l will be used for this evaluation. Subtracting the 150 mg/l from the allowable 500 mg/l yields a remaining assimilative capacity of 350 mg/l. Multiplying the 350 mg/l by the Allegheny River $Q_{7-10}$ low flow rate of 987.0 cfs and then by 5.4 for conversions yields a total assimilative capacity of 1,865,430 lbs/day of TDS at the Kittanning Suburban Joint Water Authority (PWS) intake.

The daily maximum TDS loading limit required in this renewal NPDES Permit is 48,000 lbs/day, which was calculated based on samples recorded prior to the August 21, 2010 deadline set in Chapter 95.10, which were submitted by the permittee (see Attachment 13). The calculated daily maximum TDS loading limit of 48,000 lbs/day is significantly more restrictive than the 1,865,430 lbs/day required to protect the nearest downstream Public Water Supply (PWS) intake.

g. Ammonia-Nitrogen ($NH_3$-N)

Median discharge pH to be used: 6.89 Standard Units (S.U.)

Basis: Mean pH value from last 3 years of DMRs (see Attachment 9)

Discharge temperature: 20°C (Assumptive value used for modeling purposes)

Median stream pH to be used: 7.0 Standard Units (S.U.)

Basis: Assumptive value used when no data is available

Stream Temperature: 25˚C (Assumptive value used for WWF modeling purposes)

Background $NH_3$-N concentration: N/A mg/l

Basis: No background data available for $NH_3$-N

calculated $NH_3$-N Summer limits: 7.5 mg/l (Monthly Average)
15.0 mg/l (Instantaneous Maximum)

Result: Results are slightly less stringent as the previous NPDES Permit (see Attachment 10) due to the previous yieldrate being calculated using a Q7-10 that cannot be justified, making it higher than what was calculated during this renewal. Antibacksliding is avoided since new information is provided in the form of accurate Q7-10 information.

h. $CBOD_5$ (Used EPA-DEP simplified Method)

☒ D.A. ≤500mi$^2$ $V = 2.62Q^{0.56} S^{0.083} D.A.^{-0.22}$
☐ D.A. >500mi$^2$ $V = 1.46Q^{0.56} S^{0.055} D.A.^{-0.15}$
☐ Drainage swale or ditch reach

$Q_{stream}$ = 17.00 cfs
$Q_{discharge}$ = 2.40 mgd = 3.72 cfs
$Q_{total} = Q_{stream} + Q_{discharge}$
$Q_{total}$ = 20.72 cfs
Elevation Change = 34 feet
Reach Length = 7.2 miles
Slope = 4.72 feet/mile
Drainage Area = 155.147 square miles
Velocity = 0.328 feet/second
Travel Time = 1.343 days

$K_c$: 0.06 x $CBOD_5$ effluent
$K_N$: 0.7 days$^{-1}$
$K_R$: internally calculated

Background $CBOD_5$: 2.0 mg/l Basis: Default value

Calculated $CBOD_5$ Summer limits: 21.5 mg/l (Monthly Average)
43.0 mg/l (Instantaneous Maximum)

Result: Results are slightly less stringent as the previous NPDES Permit (see Attachment 10) due to the previous yieldrate being calculated using a Q7-10 that cannot be justified, making it higher than what was calculated during this renewal. Antibacksliding is avoided since new information is provided in the form of accurate Q7-10 information.

i. Dissolved Oxygen (DO)

- ☐ 3.0 mg/l - Minimum required due to discharge going to a drainage swale or ditch.
- ☒ 5.0 mg/l - Desired in effluent for Warm Water Fisheries.
- ☐ 5.0 mg/l - Desired in effluent for Trout-Stocked Fisheries.
- ☐ 6.0 mg/l - Desired in effluent for Cold Water Fisheries.
- ☐ 7.0 mg/l - Required due to discharge going to a High Quality / Exceptional Value stream

Discussion: No Dissolved Oxygen limit will be put in permit (same as last permit).

j. Total Residual Chlorine (TRC)

- ☐ No limit necessary
- ☒ TRC limits: 0.5 mg/l (monthly average)
  1.6 mg/l (instantaneous maximum)

Basis: Technology-based limits for chlorine disinfection (see Attachment 12)

k. Total Aluminum, Total Iron, and Total Manganese

Total Aluminum, Total Iron, and Total Manganese were evaluated due to the Mahoning Creek being impaired by Abandoned Mine Drainage (AMD), among other impairments (see Attachment 4). Since a TMDL is pending, but no WLAs have been calculated as of yet, a comparison was performed to evaluate whether any limits were necessary to protect the Mahoning Creek based on the Water Quality Criteria for Total Aluminum, Total Iron, and Total Manganese. The Total Aluminum, Total Iron, and Total Manganese data for Outfall 001 is from the NPDES renewal application.

| | Aluminum (in µg/l) | Iron (in µg/l) | Manganese (in µg/l) |
|---|---|---|---|
| Water Quality Criteria | 750 (Chapter 16) | 1500 (Chapter 93.7) | 1000 (Chapter 93.7) |
| Outfall 001 maximum | non-detect | 181 | 239 |
| Outfall 001 average | non-detect | 48 | 192 |

Discussion: Since the maximum discharge concentrations are well below the Water Quality Criteria levels for the stream, no limits will be added for Total Aluminum, Total Iron, or Total Manganese at this time.

However, the discharge permitted by this NPDES Permit flows to a stream that is impaired by Abandoned Mine Drainage (AMD). In response to that impairment, the Department requires further sampling from the permittee than what is required in the NPDES Permit renewal application. To ensure that the Permittee is not contributing to the impairment, a Special Condition was added to require samples for Total Aluminum, Total Iron, and Total Manganese to be collected and submitted along with the NPDES Permit renewal application submission.

**4. Reasonable Potential Analysis Results:**

A Reasonable Potential Analysis was performed in accordance with State practices for the following pollutants of concern:

| | | | | |
|---|---|---|---|---|
| 2,4,6 Trichlorophenol | Boron | Ethylbenzene | Nickel | Silver |
| Acetone | Cadmium | Lead | Osmotic Pressure | Thallium |
| Aluminum | Cobalt | Manganese | P-Cresol | Toluene |
| Arsenic | Copper | MBAS | Phenol | Total Iron |
| Barium | Dissolved Iron | Mercury | Selenium | Zinc |
| Benzene | | | | |

Result: No WQBELs are required as a result of modeling during this renewal (see Attachments 11), except for Total Zinc (see Attachment 15). In addition to Total Zinc, since Osmotic Pressure is desired by the EPA to be monitored for POTWs that accept natural gas-related wastewaters, a monitoring requirement for Osmotic Pressure was put in this NPDES Permit.

a. Total Zinc

A WQBEL of 0.77 mg/l was calculated by the Pentox model for Total Zinc. Based on sample results from 2012 reported under the Permittee's Pretreatment Program with the US EPA (see Attachment 16), the average discharge is within 50% of the WQBEL, which represents a reasonable potential and a cause for adding the WQBEL to the NPDES Permit as an effluent limitation. A one year monitor period was added since this will be a new WQBEL.

**5. Attachment Details:**

Attachment 1 - Aerial map of facility area
Attachment 2 - STP Layout Drawing
Attachment 3 - Topographical map of facility area from the NPDES renewal application
Attachment 4 - Stream Attaining map from the PA eMap program
Attachment 5 - Low Flow Statistics for the Mahoning Creek from the USGS website
Attachment 6 - Drainage Area at discharge point from USGS StreamStats website
Attachment 7 - Drainage Area at end of stream reach from USGS StreamStats website
Attachment 8 - Drainage Area at PWS from USGS StreamStats website
Attachment 9 - Discharge Monitoring Report (DMR) summary for past three (3) years
Attachment 10 - Water Quality Model (WQM7) printouts
Attachment 11 - Multiple Discharge Analysis for Dominion and Dan-Pun with PentoxSD model printouts
Attachment 12 - TRC Calculation spreadsheet
Attachment 13 - TDS sampling data records
Attachment 14 - Chronic WET Testing summary
Attachment 15 - PentoxSD model printouts for the STP discharge
Attachment 16 - Total Zinc sampling results from the US EPA for the Punxsutawney STP
Attachment 17 - US EPA Draft NPDES Permit Comments

Please refer to the following PDF to view Attachments 1-8:


Adobe Acrobat Document

Please refer to the following PDF to view Attachments 9-17:


Adobe Acrobat Document

ADDENDUM

On April 3, 2013, Brian P. Trulear of the US EPA, forwarded comments pertaining to the Draft NPDES permit (see Attachment 17). A summary of these comments and the Department's responses follows:

| | |
|---|---|
| Comment 1: | Page 2 of the draft permit authorizes up to 15,000 gallons of natural gas related wastewater. That should be corrected to say 15,000 gallons per day. |
| Response 1: | The correction was made. |
| Comment 2: | The PENTOXSD analysis only included the flow from the oil & gas wastewater. That leads me to believe that no parameters are present in the domestic wastewater. The PENTOXSD calculated limits and reasonable potential analysis determined using this assumption does not seem to be reasonable, especially if the measured discharge concentrations used as inputs to PENTOXSD are from the entire STP wastewater flow and not just from the oil & gas flow. If the parameters analyzed in PENTOXSD are also present in the non-o&g wastewater flow, please rerun the PENTOXSD model using the full STP wastewater flow to determine limitations and reasonable potential. For example, as far as zinc being in the domestic flow, I think there is always zinc and copper, plus there is a zinc plater IU in the system. We have some data for the Punxsutawney effluent for zinc and they periodically go over 1 mg/l so it does seem that a reasonable potential analysis and a WQBEL based on the total discharge should be calculated. |
| Response 2: | I did evaluate the STP discharge parameters at the 2.4 MGD flow, I just overlooked the inclusion of the modeling results for the STP in my Fact Sheet Attachments. Regardless, and thankfully due to the time constraints for Queue Permits, no WQBELs are necessary. |

ADDENDUM (continued)

On April 12, 2013, Brian P. Trulear of the US EPA, forwarded comments pertaining to the Draft NPDES permit (see Attachment 17). A summary of these comments and the Department's responses follows:

| | |
|---|---|
| Comment 1: | Thanks for providing the revisions to the draft permit and fact sheet. After reviewing the Attachment 15 PENTOXSD printouts, I have a question regarding the zinc analysis. As I mentioned in my e-mail on April 3rd, our pretreatment program receives zinc effluent data as part of the pretreatment reporting requirements and there are several samples that exceed the value used in the PENTOXSD model of 0.257 mg/l for the discharge value. In fact, there are several values above the calculated WQBEL of 0.78 mg/l. See the attached pdf file (data from 2006 thru 2011 – we don't have the 2012 data yet). This additional data should be used as part of the reasonable potential analysis. Please take this into consideration when determining whether or not zinc needs to be limited in the permit. |
| Response 1: | The Pentox model was re-run with new inputs based on 2012 data that was not available before. With the new inputs, the WQBEL remained unchanged, but the average discharge is now within 50% of the WQBEL, which represents a reasonable potential and a cause for adding the WQBEL to the NPDES Permit as an effluent limitation. |